U.S. Customer Vision for DME Interface Spec

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The National Institute of Standards and Technology (NIST)

NIST mission:

Support U.S. industry through standards research and standards facilitation. Seek to create and enable high risk and high payoff commercial technologies

Metrology System Interoperability Project mission:

Solve, in collaboration with industry, near and far term interoperability problems of metrology systems by facilitating high quality and timely data interchange standardization and test suite development

Customer opinions about interoperability in general

- Goal of data interface standards efforts: interoperability with sufficient functionality
- Variety of levels of frustration with existing standards (e.g., DMIS and IGES)
  - Lack of testing, validation, and uniform customer requirements
- Single vendor solution common
- Legacy systems pose a unique problem
- Hands-on types and hands-off types
- “Every part correct” or (at least) in-process inspection is the ultimate desire
- Highest priority tasks: DMIS conformance, CAD with tolerance, standard reporting, and common DME

Customer comments on DME interface specifications

- Need to ensure a vendor-neutral spec and a vendor-neutral development process
  - Quote: “I am concerned that certain vendors could drive the test in the direction of their particular bias. There must be fair testing.”
- NC machining standards need to be harmonized with CMM inspection standards
  - Quote: “I++ and STEP-NC should be a cohesive single effort.”
- DME spec should allow for either uncompensated or compensated geometric data
  - Quote: “There should be an ‘either/or’ switch.”
  - Quote: “I want [all data] to be fully compensated up to the accuracy of the vendor equipment.”

Customer comments on DME interface specifications

- DME spec should allow for either uncompensated or compensated thermal data
  - Quote: “There are three types of thermal compensation 1) on the part, requiring compensation on the client side, 2) on the CMM itself, in which compensation can be done on either side but is probably best done on the server side, and 3) on the sensor assembly, and since thermal compensation of the CMM is typically only to the RAM, such compensation needs to be allowed on the client side.”
  - Quote: “In the real world we will have to continue to deal with uncompensated thermal data [on the client side] because of legacy CMMs.”
- DME spec should allow for either uncalibrated or calibrated sensor data
  - Quote: “I want [all data] to be fully compensated up to the accuracy of the vendor equipment.”
  - Quote: “I want to be able to calibrate sensor data on the client side.”

Customer comments on DME interface specifications

- Need to have optical and non-contact CMMs on the development schedule
  - Quote: “I think that the spec should include the ability to operate optical metrology equipment or its long term applicability to our business process might be in question”
  - Quote: “The inclusion of non-contact CMMs should not be the highest priority.”
  - Quote: “In 10 years I expect that all CMMs will be non-contact, therefore the ability to handle optical and non-contact CMMs is very important.”
- Want spec to ensure that time-critical events are not dependent on a “real-time” response from the client
  - Quote: “We have ‘semi-real-time’ requirements for the DME interface.”
  - Quote: “It would be useful to be able to operate the client side software remotely [in non-real-time mode].”